PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	10/811,161
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Appellant:	Manish Sinha
Group Art Unit:	1795
Examiner:	Keith D. Walker
Title:	LOAD FOLLOWING ALGORITHM FOR A FUEL CELL BASED DISTRIBUTED GENERATION SYSTEM
Attorney Docket:	GP-303576

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APPELLANT'S APPEAL BRIEF

This is Appellant's Appeal Brief filed in accordance with 37 CFR §41.37 appealing the Examiner's Final Office Action mailed December 5, 2008. Appellant's Notice of Appeal, pursuant to 37 CFR §41.31, was filed on March 3, 2009. The Appeal Brief fee pursuant to 37 CFR §41.20(b)(2) is included herewith.

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I. Real Party in Interest

The real party in interest for this appeal is the General Motors Corporation of Detroit, Michigan, the assignee of this application.

II. Related Appeals and Interferences

There are no related appeals, interferences or judicial proceedings that will directly affect or be directly affected by the Board's decision in this appeal.

III. Status of the Claims

Claims 1-22 are pending. Claims 16-22 have been withdrawn from consideration as being directed to a non-elected invention. Claims 1-15 are on appeal. Claims 1-15 stand rejected. No claim has been allowed. No claim has been objected to. No claim has been cancelled.

IV. Status of Amendments

No amendments have been made in this application.

V. Summary of Claimed Subject Matter

Independent claim 1 claims a fuel cell distribution system for controlling power being applied to a system load, such as fuel cell distribution generation system 40 including system loads 50 shown in figure 2. The system 40 includes a fuel cell module 42 with a fuel cell that generates a draw current and a power conditioning module 44 responsive to the draw current, see paragraph [0022], page 6, line 22 – page 7, line 2. The power conditioning module 44 conditions the draw current and applies the conditioned draw current to the system loads 50, see paragraph [0023], page 7, lines 3-8.

The system 40 also includes a fuel cell sensor 54 that measures the draw current from the fuel cell module 42 and provides the measured draw current to a fuel cell controller 56, see paragraph [0024], page 7, lines 9 – 13. The fuel cell controller 56 operates a load following algorithm that provides a command signal applied to the fuel cell module 42 that sets the available output power from the fuel cell module 42, see page 7, lines 15 – 17 and paragraph [0024]. The load following algorithm defines a maximum draw current signal applied to the power conditioning module 44 that defines a maximum draw current to be drawn from the fuel cell module 42, see paragraph [0025], page 7, lines 20-26.

Independent claim 13 claims a fuel cell distribution system for controlling power being applied to a system load, such as fuel cell distribution generation system 40 including system loads 50 shown in figure 2. The system 40 includes a fuel cell module 42 with a fuel cell and a battery that generates a draw current and a power conditioning module 44 responsive to the draw current and a battery current, see paragraph [0022], page 6, line 22 – page 7, line 2. The power conditioning module 44 conditions the draw current and the battery current and applies the conditioned draw current and battery current to the system loads 50, see paragraph [0023], page 7, lines 3-8.

The system 40 also includes a fuel cell sensor 54 that measures the draw current from the fuel cell module 42 and provides the measured draw current to a fuel cell controller 56, see paragraph [0024], page 7, lines 9 – 13. The fuel cell controller 56 operates a load following algorithm that provides a command signal applied to the fuel cell module 42 that sets the available output power from the fuel cell module 42, see page 7, lines 15 – 17 and paragraph [0024]. The load following algorithm defines a maximum draw current signal applied to the power conditioning module 44 that defines

a maximum draw current to be drawn from the fuel cell module 42, see paragraph [0025], page 7, lines 20-26.

The load following algorithm also defines an approach threshold region, shown in figure 3 between graph lines 66 and 68, where graph line 66 represents the maximum current available from the fuel cell module 42, see paragraphs [0026] and [0027], page 7, line 28 – page 8, line 5. The fuel cell controller 56 increases the available output power from the fuel cell module 42 by a command signal on line 58 if the drawn current measured by the current sensor 54 enters the approach threshold region and the load following algorithm maintains the available output power from the fuel cell module 42 constant by the command signal on the line 58 if the draw current measured by the current sensor 54 goes above the approach threshold region, see paragraph [0024], page 7, lines 16 – 21 and paragraph [0027], page 8, lines 4-18.

The load following algorithm also defines a diverge threshold region between the graph lines 68 and 70 shown in figure 3, see paragraph [0028], page 8, lines 19-21. The fuel cell module 42 decreases the available output power from the fuel cell module 42 by the command signal on the line 58 if the draw current measured by the current sensor 54 enters the diverge threshold region, and the load following algorithm maintains the available output power constant by the command signal on the line 58 if the draw current measured by the current sensor 54 leaves the diverge threshold, see paragraph [0028], page 8, lines 19-29.

The approach threshold and diverge threshold regions defined by the load following algorithm determine how the fuel cell module 42 is operated with respect to the draw current from the current sensor 54. If the current being drawn is much less than the maximum draw current, then hydrogen utilization is low. However, if the draw current is close to the maximum draw current, it is possible due to measurement error

that the current is actually greater than the maximum draw current and can damage the fuel cell module 42, see paragraph [0029], page 8, line 30 – page 9, line 4.

VI. Grounds of Rejection to be Reviewed on Appeal

Whether claims 1-5 and 10-13 should be rejected under 35 USC §102(b) as being anticipated by, or in the alternative, under 35 U.S.C. §103(a) as being unpatentable over United States Patent Publication No. 2001/004903 to Dickman (hereinafter Dickman);

Whether claims 1-5 and 10-13 should be rejected under 35 USC §102(b) as being anticipated by, or in the alternative, under 35 U.S.C. §103(a) as being obvious over United States Patent Application Publication No. 2002/0082785 to Jones (hereinafter Jones);

Whether claims 6-9 and 14 and 15 should be rejected under 35 USC §103(a) as being unpatentable over Dickman; and

Whether claims 6-9, 14 and 15 should be rejected under 35 U.S.C. §103(a) as being unpatentable over Jones.

VII. Argument

A. Claims 1-5 and 10-13 are not anticipated by or made obvious by Dickman

1. Independent claims 1 and 13

Independent claim 1 claims a fuel cell distribution system for controlling power being applied to a system load that includes a fuel cell generating a draw current; a power conditioning module responsive to the draw current that conditions the draw current and applies the conditioned draw current to the system load; a fuel cell sensor

that measures the draw current from the fuel cell; and a fuel cell controller that receives the measured draw current from the fuel cell sensor, where the fuel cell controller operates a load following algorithm that provides a command signal to the fuel cell that sets the available output power from the fuel cell where the load following algorithm also provides a maximum current drawn signal to the power conditioning module that defines a maximum draw current to be drawn from the fuel cell.

Independent claim 13 claims a fuel cell distribution system for controlling power being applied to a system load that includes a fuel cell generating a draw current; a battery generating a battery current; a power conditioning module that conditions the draw current and the battery current and applies the conditioned current to the system load; a fuel cell sensor that measures the draw current from the fuel cell; and a fuel cell controller that receives the measured draw current and operates a load following algorithm that defines a command signal applied to the fuel cell and sets the available output power of the fuel cell, where the load following algorithm also defines a maximum draw current applied to the power conditioning module that defines a maximum draw current to be drawn from the fuel cell, defines an approach threshold region where the fuel cell controller increases the available output power by the command signal if the draw current enters the approach threshold region and maintains the available output power constant by the command signal if the draw current leaves the approach threshold region, and also defines a diverge threshold region, where the fuel cell controller decreases the available output power by the command signal if the draw current enters the diverge threshold region and where the load following algorithm maintains the available output current constant by the command signal if the draw current leaves the diverge threshold region.

2. Dickman

Dickman discloses various embodiments of a fuel cell system 60 including a plurality of fuel cell stacks 76 that provide partial or total redundancy. Figure 5, as discussed in paragraph [0048], shows one embodiment of the system 60 that includes a power management module 81 through which electric power from the fuel cell stacks 76 is delivered to a load 80. A schematic diagram of the power management module 81 is shown in figure 6 and includes a DC-DC converter 93, a switching assembly 92, an inverter 85 and a battery assembly 86 including batteries 88 and a charger 90.

Figure 10 shows an embodiment of the fuel cell system 60 including a control system 120 having a controller 122, as discussed in paragraph [0057]. The controller 122 communicates with various components in the fuel cell system 60 through communication links 124. Inputs to the controller 122 include one or more current operating conditions, such as temperature, pressure, flow rate, composition, state of actuation, load, etc. Paragraph [0059] states that the control system 120 may be used to selectively isolate a stack from the applied load by sending a control signal to a corresponding contactor 100. Paragraph [0061] states that the control system 120 may additionally or alternatively be used to selectively adjust or interrupt the flow of hydrogen gas, air and/or cooling fluid to one or more of the stacks 76. Paragraph [0063] states that the controller 122 may be adapted to select the stack to remove from service according to a predetermined sequence. Paragraph [0064] states that control system may include a user interface 130. Paragraph [0067] states that the control system 120 may be adapted to limit the magnitude of the peak load, or maximum desired power output, applied to the fuel cell stack assembly 77.

3. Discussion

Appellant respectfully submits that the Examiner has not provided a proper rejection under 102(b) or 103(a) because there is insufficient discussion in the Office Action as to how the teachings of Dickman apply to claims 1-5 and 10-13. The Examiner's discussion concerning the rejection of these claims basically includes only the following statement:

> Dickman teaches a fuel cell system with a power conditioning module that applies conditioned current to a load, a current meter for measuring and reporting the fuel cell's current and a fuel cell controller (Abstract, [0046, 0048, 0049, 0057, 0064]. The controller sets the available output power from the fuel cell and defines the maximum current drawn from the fuel cell through the power conditioning module ([0034, 0035, 0049 & 0041]). As the upper threshold of the available power of the operating fuel cell stacks is reached, the controller increases the available power by increasing the number of operating fuel cells. Alternatively, if the power demand decreases below a threshold, then the available power is decreased by reducing the number of operating fuel cells ([0046, 0051 & 0067]).

The Examiner states that paragraphs [0046], [0048], 0049], [0057] and [0064] teach a power conditioning module that applies a condition current to a load, a current meter for measuring and reporting the fuel cells current and a fuel cell controller. Appellant submits that fuel cell systems known in the art do include power conditioning modules, fuel cell controllers and current sensors, but not specifically a fuel cell current sensor that measures the draw current of a fuel cell being sent to a power conditioning module of the type claimed, where the measured current is sent to a fuel cell controller that then provides a command signal to the fuel cell using that measured current. Appellant submits that the Examiner has merely stated that Dickman includes these elements, without providing support as to where specifically these elements are found in Dickman and how they interact in the manner as claimed. Appellant respectfully

submits that the power management module 81 discussed above does not include these elements as claimed.

The Examiner has also stated that paragraphs [0034], [0035], [0040] and [0041] teach a controller that sets the available output power from the fuel cell and defines the maximum current drawn from the fuel cell through a power conditioning module. Once again, the Examiner has not provided any discussion as what element is the controller and the power conditioning module in Dickman operates in this manner. Presumably, the controller and the power conditioning module talked about in these paragraphs is the same controller and power conditioning module that the Examiner states exists in paragraph [0046], [0048], [0049], [0057] and [0064]. However, Appellant can see no teaching in these paragraphs as to how any of the elements taught by Dickman are shown by or are interconnected, as claimed.

Further, the Examiner states that, as the upper threshold of the available power for the operating fuel cell stacks is reached, the controller increases the available power by increasing the number of operating cells. Alternatively, if the power demand decreases below a threshold, then the available power is decreased by reducing the number of operating cells, citing paragraphs [0046], [0051] and [0067]. Appellant submits that the Examiner has not defined how these operations are performed by Dickman, or how these elements operate a load following algorithm that defines a command signal applied to the fuel cell that sets the available output power from the fuel cell and also defines a maximum current draw signal applied to a power conditioning module as claimed that defines the maximum draw current to be drawn from the fuel cell.

Furthermore, Appellant submits that these, or any other, paragraphs in Dickman do not teach the specifics of independent claim 13 where the load following algorithm

defines an approach threshold, where the fuel cell controller increases the available current output of the fuel cell by the command signal if the draw current enters the approach threshold, where the load following algorithm maintains the available output power constant by the command signal if the draw current leaves the approach threshold, and where the load following algorithm defines a diverge threshold region, where the fuel cell controller decreases the available output power by the command signal if the draw current enters the diverge threshold region, and where the load following algorithm maintains the available output power constant by the command signal that the draw current leaves the diverge threshold. These limitations of the load following algorithm can also be found in dependent claims 2-5.

Also, the Examiner makes no comment as to where Dickman teaches a battery current sensor for measuring battery current, where the fuel cell controller receives the measured battery current signal and increases the available output power if the battery sensor measures a predetermined battery current continuously for a predetermined period of time, as set forth in dependent claims 6, 7 and 14, and independent claim 13. Appellant can find no teaching in Dickman of either of these claim elements.

The Examiner also makes no mention of a battery voltage sensor that measures a battery voltage, where the fuel cell controller receives the battery voltage signal, monitors battery voltage drift and determines a charging current applied to the battery by increasing the power generated by the fuel cell stack, as claimed in dependent claims 8, 9 and 15. Appellant also can find no teaching in Dickman of a battery voltage sensor and a fuel cell controller that operate in this manner.

The Examiner dismisses the claim limitations of dependent claims 10-12 as intended use. Appellant submits that Dickman does not teach these claim limitations either.

B. Claims 1-5 and 10-13 are not anticipated or made obvious by Jones

Jones discloses a fuel cell system 10 that includes a technique for responding to up and down transients of the power output from a fuel cell stack. The Jones fuel cell system 10 includes a controller 60 that includes a voltage regulator 30 and an inverter 33 between a fuel cell stack 20 and a system load 50. Figure 3 is a graph showing the output power from the fuel cell stack 20. Paragraph [0030] talks about figure 3 and states that the graph shows a hysteresis zone 121 having an upper threshold 121a and a lower threshold 121b. As long as the power drawn by the load 50 is within the zone 121, the controller 60 determines that a transient has not occurred. If the power drawn by load 50 exceeds one of the thresholds 121a or 121b, the controller 60 recognizes that a transient has occurred. The main thrust of the Jones disclosure has to do with providing a delay in response to an up or down transient so that the fuel and air provided to the fuel cell stack 20 is not immediately changed so that the system does not respond to temporary up or down transients, see paragraph [0032]. If a delay interval passes, then the controller 60 determines that additional or less fuel and air should be provided to accommodate the transient.

Appellant submits that the algorithm in Jones that controls the system response to up and down transients can be considered some type of a load following algorithm. However, the Jones process for responding to an up or down transient is different than that claimed by Appellants for their load following algorithm. Appellant's process does not necessarily provide a delay in response for a transit, and addresses the transients in a different manner. Appellant submits that all fuel cell systems have some type of process for responding to up and down transients and those processes can be very different.

Appellant respectfully submits that the Jones process does not provide a command signal applied to a fuel cell that sets the available output power from the fuel cell, and does not define a maximum current draw signal applied to a power conditioning module that defines a maximum current that can be drawn from the fuel cell. The controller 60 in Jones is not even coupled to the voltage regulator 30 or the inverter 33. Thus, these or any other devices in the Jones system that can be considered a power conditioning module do not receive a signal defining a maximum current draw from the controller.

The Examiner has directed Appellant's attention to paragraphs [0029] and [0038] as teaching Appellant's claimed load following algorithm. Appellant has carefully reviewed these paragraphs in Jones and can find no teaching therein that the controller 60 provides a command signal that is sent to the fuel cell stack 20 to set the available output power from the fuel cell stack 20 and a maximum current draw signal that defines a maximum current that can be drawn from the fuel cell stack 20 that is sent to a power conditioning module that conditions the output from the fuel cell stack to the load on the stack. Clearly, Jones does not teach or suggest the detailed operation of the load following algorithm in independent claim 13.

In rejecting all of claims 1-5 and 10-13 in view of Jones, the Examiner has basically only provided the comments on page 4 of the Final Office Action as:

> Jones teaches a fuel cell system comprising a fuel cell, a battery, a controller and current and voltage sensors. The fuel cell controller uses an algorithm to control the operation the fuel cell system (Abstract, [0018, 0021, 0022, 0024, 0027]). The voltage and current sensors inform the controller of the output voltage and current from the fuel cell as required by the load. A power conditioning module converts the power into AC voltage and supplies the power to load ([0052]). The controller increases the available power output when an approach threshold is reached and maintains a constant power when the required power is not longer near

> the approach threshold. In a similar manner power is decreased when a diverge threshold is reached and then a constant power is maintained when the required power is no longer near the diverge threshold ([0029-0038]). The maximum current draw and available output power are set by the number of fuel cells in the stack and the available reactants flowing to the cells.

As with Dickman above, the Examiner has failed to provide specific recitation as to how Jones teaches the various elements of the claims.

C. Claims 6-9, 14 and 15 are not obvious in view of Dickman

The Examiner states that, "Dickman teaches using current and voltage sensors with the fuel cell system and further teaches detecting and comparing voltage of the load with the DC-DC converter and analyzing the stack performance," citing paragraphs [0048] and [0060]. Those paragraphs are recreated below.

> [0048] In FIG. 5, an embodiment of system 60 is shown that includes a power management module 81 through which electric power from the plurality of fuel cell stacks is delivered to device 80. As shown, power (or current) 78 from stack assembly 77 passes through module 81 and then is subsequently delivered to device 80 as indicated at 83. When device 80 requires AC power, module 81 will include an inverter for converting the DC power from the fuel cell stacks to AC power. An example of a power management module including an inverter 85 is schematically illustrated in FIG. 6. Module 81 may additionally or alternatively include a battery assembly 86 containing one or more batteries 88 and associated chargers 90, which are adapted to store excess power, as well as switching assembly 92 that is adapted to selectively deliver power from stack assembly 77 to either device 80 or to the battery assembly. Module 81 may additionally, or alternatively, include at least one DC-DC converter 93, such as at least one boost DC-DC converter that increases the voltage of current 78 or at least one buck DC-DC converter that decreases the voltage of current 78. Converter 93 receives the unregulated DC stream from stack assembly 77, the voltage of which is variable with the applied load, and regulates the voltage of the stream to a selected value. The selected value may be more or less than the unregulated voltage and it may also vary depending upon whether the output stream of the converter is going to battery assembly 86 or device 80. Module 81

> may contain a DC-DC converter for each stack 76, or alternatively, each fuel cell stack may be electrically connected to, or include, a dedicated DC-DC converter 93, such as schematically illustrated in FIG. 7 with dashed lines. As shown, the DC-DC converters may be integrated with fuel cell stacks 76, with contactors 100, or they may be discrete units downstream from the fuel cell stacks. The regulated DC output from the dedicated DC-DC converters may be connected in parallel or series. It should be understood that module 81 may include components other than those discussed herein, and that not all of the above components are required in every embodiment of a power management module.
>
> [0060] In embodiments of the fuel cell system in which each fuel cell stack 76 includes its own DC-DC converter, each DC-DC converter may be adapted to automatically isolate the corresponding stack if the stack is delivering substandard performance in response to the applied load. For example, if a particular DC-DC converter does not receive current 78 having a voltage that exceeds a selected minimum voltage, then the DC-DC converter automatically isolates the stack from the applied load, such as by actuating contactor 100 or a suitable contactor or other switch associated with the DC-DC converter.

Appellant has carefully reviewed these paragraphs in Dickman and can find no teaching therein of a battery current sensor or a fuel cell controller responsive to a battery current signal that increases the available output power if the battery sensor measures a predetermined battery current continuously for a predetermined period of time. Further, Appellant can find no teaching in these paragraphs of a battery voltage sensor that measures the battery voltage or a fuel cell controller that receives the measured battery voltage, monitors battery voltage drift and determines a charging current applied to the battery by increasing the power generated by the fuel cell. Therefore, Appellant respectfully submits that the Examiner has failed to provide a *prima facie* case of obviousness in view of these teachings in Dickman.

D. Claims 6-9, 14 and 15 are not obvious in view of Jones

The Examiner states on page 6 of the final Office Action that claims 6-9, 14 and 15 are made obvious by Jones because Jones teaches using current and voltage sensors with the fuel cell system and further teaches detecting and comparing voltages of the load with the DC-DC converter and analyzing the stack performance," citing paragraphs [0048] and [0060].

Paragraph [0048] of Jones is recreated below:

> [0048] Instead of using rolling averages to establish the first and second delay intervals, in some embodiments of the invention, the controller 60 may measure a delay interval that has a constant, or fixed, duration. In this manner, the controller 60 may introduce a fixed delay interval that is shorter in duration for responding to sustained decreases in the power that is demanded by the load 50 and introduce a fixed delay interval that is longer in duration for responding to sustained increases in the power that is demanded by the load 50.

This paragraph talks about measuring a delay interval to respond to decreases in stack power, and does not say anything about measuring battery current or voltage, as claimed. Therefore, Appellant submits that Jones does not provide the teaching necessary to make these claims obvious.

It does not appear that Jones includes a paragraph [0060].

VIII. Conclusion

Appellant respectfully submits that claims 1-5 and 10-13 are not anticipated or made obvious by Dickman, claims 1-5 and 10-13 are not anticipated or made obvious by Jones, claims 6-9, 14 and 15 are not obvious in view of Dickman and claims 6-9, 14

and 15 are not obvious in view of Jones. It is therefore respectfully requested that the Examiner's rejections be reversed, and Appellant's claims be allowed.

Respectfully submitted,

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CLAIMS APPENDIX

COPY OF CLAIMS INVOLVED IN THE APPEAL

1. (Original) A fuel cell distribution system for controlling power being applied to a system load, said system comprising:

a fuel cell, said fuel cell generating a draw current;

a power conditioning module responsive to the draw current, said power conditioning module conditioning the draw current and applying the conditioned draw current to the system load;

a fuel cell sensor, said fuel cell sensor measuring the draw current from the fuel cell and generating a fuel cell signal indicative of the measured draw current; and

a fuel cell controller responsive to the fuel cell signal, said fuel cell controller operating a load following algorithm that defines a command signal applied to the fuel cell that sets the available output power from the fuel cell, said load following algorithm also defining a maximum current draw signal applied to the power conditioning module that defines a maximum draw current to be drawn from the fuel cell.

2. (Original) The system according to claim 1 wherein the load following algorithm defines an approach threshold region, and wherein the fuel cell controller increases the available output power by the command signal if the draw current enters the approach threshold region.

3. (Original) The system according to claim 2 wherein the load following algorithm maintains the available output power constant by the command signal if the draw current leaves the approach threshold region.

4. (Original) The system according to claim 1 wherein the load following algorithm defines a diverge threshold region, and wherein the fuel cell controller decreases the available output power by the command signal if the draw current enters the diverge threshold region.

5. (Original) The system according to claim 4 wherein the load following algorithm maintains the available output power constant by the command signal if the draw current leaves the diverge threshold region.

6. (Original) The system according to claim 1 further comprising a battery and a battery current sensor, said battery providing battery current for the system load and said battery current sensor measuring the battery current, said battery current sensor generating a battery current signal indicative of the measured battery current.

7. (Original) The system according to claim 6 wherein the fuel cell controller is responsive to the battery current signal, said fuel cell controller increasing the available output power if the battery sensor measures a predetermined battery current continuously for a predetermined period of time.

8. (Original) The system according to claim 1 further comprising a battery and a battery voltage sensor, said battery providing battery voltage for the system load and said battery voltage sensor measuring the battery voltage, said battery voltage sensor generating a battery voltage signal indicative of the measured battery voltage.

9. (Original) The system according to claim 8 wherein the fuel cell controller is responsive to the battery voltage signal, said fuel cell controller monitoring battery voltage drift and determining a charge current applied to the battery by increasing the power generated by the fuel cell.

10. (Original) The system according to claim 1 wherein the system provides power to a vehicle.

11. (Original) The system according to claim 1 wherein the system is part of a vehicle control system that follows unmeasured loads in a vehicle.

12. (Original) The system according to claim 11 wherein the unmeasured loads are from a vehicle heating ventilation and air conditioning system.

13. (Original) A fuel cell distribution system for controlling power being applied to a system load, said system comprising:

a fuel cell, said fuel cell generating a draw current;

a battery, said battery generating a battery current;

a power conditioning module responsive to the draw current and the battery current, said power conditioning module conditioning the draw current and the battery current and applying the conditioned draw current and battery current to the system load;

a fuel cell sensor, said fuel cell sensor measuring the draw current from the fuel cell and generating a fuel cell signal indicative of the measured draw current; and

a fuel cell controller responsive to the fuel cell signal, said fuel cell controller operating a load following algorithm that defines a command signal applied to the fuel cell that sets the available output power from the fuel cell, said load following algorithm also defining a maximum draw current signal applied to the power conditioning module that defines a maximum draw current to be drawn from the fuel cell, said load following algorithm defining an approach threshold region, wherein the fuel cell controller increases the available output power by the command signal if the draw current enters the approach threshold region, and wherein the load following algorithm maintains the available output power constant by the command signal if the draw current leaves the approach threshold region, said load following algorithm also defining a diverge threshold region, wherein the fuel cell controller decreases the available output power by the command signal if the draw current enters the diverge threshold region, and wherein the load following algorithm maintains the available output power constant by the command signal if the draw current leaves the diverge threshold region.

14. (Original) The system according to claim 13 further comprising a battery current sensor, said battery current sensor measuring the battery current, said battery current sensor generating a battery current signal indicative of the measured battery current, wherein the fuel cell controller is responsive to the battery current signal, said fuel cell controller increasing the available output power if the battery sensor measures a predetermined battery current continuously for a predetermined period of time.

15. (Original) The system according to claim 13 further comprising a battery voltage sensor, said battery voltage sensor measuring the battery voltage, said battery voltage sensor generating a battery voltage signal indicative of the measured battery voltage, wherein the fuel cell controller is responsive to the battery voltage signal, said fuel cell controller monitoring battery voltage drift and controlling a charge current applied to the battery.

EVIDENCE APPENDIX

There is no evidence pursuant to §1.130, §1.131 or §1.132.

RELATED PROCEEDINGS APPENDIX

There are no decisions rendered by a court or the Board in any proceeding identified in Section II of this Appeal Brief.